Short Communications

Endocrine Aspects of Bromocriptine Therapy in Parkinsonism

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With 1 Figure

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Summary

Plasma growth hormone (GH) concentrations in Parkinsonian patients following 3 months optimum therapy with bromocriptine showed no significant change from pretreatment values, whilst plasma prolactin concentrations were uniformly suppressed. Pretreatment GH and prolactin levels were unrelated to clinical disability, and no correlation between hormonal changes and therapeutic response was found. These results suggest the presence of different dopaminergic receptor mechanisms for GH and prolactin release as well as between the extrapyramidal and neuroendocrine systems.

Introduction

Dopaminergic mechanisms are important in the function of the extrapyramidal system, in the control of mood and emotion and in the regulation of hypothalamic and pituitary endocrine activity, while peripheral effects have also been noted in the kidney, pancreas and blood vessels (Thorner, 1975). In the treatment of Parkinsonism with levodopa, nonspecific dopaminergic stimulation may, therefore, give rise to unwanted effects including changes in mental behaviour, blood pressure and endocrine activity. The need for increased specificity of
action has promoted interest in the development of new dopamine agonist drugs.

The endocrine effects of levodopa in Parkinsonism, including stimulation of GH release and suppression of prolactin, have been well documented (Boyd et al., 1970, 1971; Sirtori et al., 1972). Bromocriptine, recently introduced as alternative therapy for Parkinsonism (Calne et al., 1974; Lees et al., 1975; Parkes et al., 1976a) is a dopamine agonist with potent neuroendocrine activity (Lancet Editorial 1975). Interest in the relationship between Parkinsonism and underlying hormonal patterns (Tang and Cotzias, 1976; Cotzias et al., 1971; Horrobin, 1976) prompted us to evaluate basal serum GH, prolactin levels and the responses of prolactin and thyroid stimulating hormone (TSH) to thyrotrophin-releasing hormone (TRH) in patients before and after longterm treatment with bromocriptine (Lees et al., 1977).

Patients and Methods

Plasma GH concentrations were measured in 32 Parkinsonian patients (mean age 61 years) before treatment and after a minimum of 2 months on optimum dosage of bromocriptine. Patients were admitted for 24 hours, fasted overnight, and kept resting in bed during the period of study. Pre-prandial GH measurements were made at 9 a.m. (fasting, 2 hours after bromocriptine), 12 noon (5 hours after drug) and 5 p.m. (30 min and 4½ hours after drug) and a mean of the 3 values determined. Plasma GH concentration was measured by radioimmunoassay and the results expressed in terms of W.H.O. standard 66/217 (normal fasting plasma GH concentration < 10 mU/l). In 14 of these patients single plasma prolactin concentration was estimated before and on maximum bromocriptine therapy. Serum prolactin levels were measured by radioimmunoassay as described by Franks et al. (1975) using reagents kindly supplied by the NPA (NIAMD) U.S.A. (normal range in adult women 3—15 µg/l [VLS-1 standard]; men 3—12 µg/l). A standard TRH test (200 µg i.v.) was performed in a further 9 patients; control blood samples for TSH and prolactin levels were taken and again at 20 and 60 min following TRH injection.

The 32 patients in whom GH response was assessed, were taking an average dose of 58.9 mg of bromocriptine daily (range 12.5—120 mgs) with a mean duration of therapy of 12 weeks (range 8—16 weeks). The average daily doses for those patients whose prolactin concentrations were measured and in whom TRH tests were performed were 57.2 mgs and 40.6 mgs respectively. No patient received levodopa during these studies.

Results

Plasma GH and prolactin concentrations are shown in Table 1. Basal pretreatment GH levels were normal and the mean rise in